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COURTSHIP AND COPULATION IN BROCHYMENA SULCATA VAN D.

BY HERBERT RUCKES, New York, N. Y.

During the summer of 1937 the pentatomid, *Brochymena sulcata* Van D. appeared in great abundance in the vicinity of Las Cruces New Mexico. The insect was found on the trunks of apples, honey locust (*Gleditsia triacanthos* L.) and red mulberry (*Morus rubra* L.). Hundreds of individuals were observed on the last two hosts, trees that line the roadway through the grounds of the State College at Mesilla Park. The latter part of August appears to be the mating season for this species, for on the 28th of that month the following notes were made concerning the courtship and copulation.

Mating apparently goes on during the morning and afternoon; no pairs in copulation were observed during the late evening nor could any be found, with the aid of a spot light, after dark. Prior to the actual copulation the males showed a peculiar behavior toward the females. Females remain relatively passive during this time while the males run hurriedly up and down the tree trunks; while so doing they invariably keep up a noticeable beating of their antennae, moving them rhythmically in various directions. Frequently, as a male comes in contact with a female's body he strokes it with his antennae, seemingly to determine whether or not she is prepared to consummate the mating.

The male mounts on the female's back in the orthodox manner; then a most remarkable act occurs. The genital cup of the male is so constructed that the claspers and penis open from the upper surface of the segment. The male finds it necessary to rotate this cup

on its longitudinal axis through 180 degrees, so that the penis and claspers will be exposed ventrally and thus may be directly everted to enter the valves of the female body. I actually saw this act take place in a number of cases; whether or not it occurs in all pairs I cannot say but it seems likely that it does, the male genital cup being constructed as it is. I have an idea that such behavior is common in other pentatomids as well for it is not at all uncommon to find pinned specimens, in collections, in which the male genital segment is inverted, the specimens possibly have been taken during or just after copulation.

During the process by which the male completes the insertion, the female rests quietly but opens, slightly, the pairs of wings and when so doing automatically opens the valves of her genital segment. When the physical contact is completed the male then proceeds to dismount and remains in copulation attached to the female endwise as is typical of so many other heteroptera.

During the last stages of the mating, the male, facing in the opposite direction to that of the female begins vibrating his hind legs; in doing this he causes his tarsi and tibiae to brush the lateral edges of the female's abdomen, possibly transmitting to her some erotic stimulus. The rhythm of the beating seems to be timed; without the use of an accurate device no exact count could be made but the vertical movements of the legs appear to occur about two or three times per second.

How long the pairs remain in copulation I did not determine; certainly most of them keep up the physical contact for two hours, for it was that length of time I spent in making most of these observations. When disturbed some pairs would separate but most moved off to a nearby locality and the males would, after a brief interval, start the rhythmic beating of their hind legs all over again.

NOTES ON THE LARVAE OF HELIOTHINAE.

BY ALEX K. WYATT, Chicago, Ill.

A renewed interest in *Schinia* and allied genera has resulted in the discovery of the early stages, heretofore unknown, of several species and additional data on others found in the Chicago area.

Heliothis phloxiphaga G. & R.

This has been reared several times by Mr. Emil Beer and others besides myself from larvae feeding on blossoms and seeds of Columbine, *Delphinium* and New England Aster. Single larvae were also